

JAPANESE BOTANY.

New Lessons in Elementary Botany (Saishin Shokubutsugakkô Kwasho). By Itô Tokutarô, Rigaku Hakushi, D.Sc., F.L.S.

OF this well got up, well illustrated, and lucidly written elementary treatise on botany the following translation of the introductory chapter or preface will give an adequate general idea.

It describes the province of botany in a manner likely to interest a young Japanese student.

"The surface of the globe we live on is covered with a varied and abundant vegetation, differing and agreeing in accordance with differences and likenesses of soil and climate. In this Japan of ours, which is a land within the temperate zone, many and beautiful are the flowers of the wild plants that blow at the various seasons of the year. In spring we have the *sakura* (wild cherry), the *yamabuki* (*Kerria*), the *tsutsuji* (azalea), the *fuji* (*wistaria*); in summer the *Ayame* (iris), the *kakitsubata* (*Iris laevigata*?), the *yuri* (lily); in autumn the *hagi* (*Lespedeza*), the *kikyô* (*Platycodon*), the *ominamishi* (*Patrinia*); in winter the *tsubaki* (*Camellia*), *sazankwa* (mountain tea-flower) and the *fukujyusô* (*Adonis amurensis*).

"Among cultivated plants we have the *ume* (plum), *momo* (peach), *Kaidô* (*Pyrus spectabilis*), *botan* (peony), *shakuyaku* (*Paeonia albiflora*), *asagaho* (morning glory), *fuyô* (*Hibiscus mutabilis*) and *kiku* (chrysanth).

"On the hill slopes grow the *matsu* (*Pinus*), *sugi* (*Cryptomeria*), *hinoki* (*Chamæcyparis*), *keyaki* (*Zelkova acuminata*), *yenoki* (*Celtis sinensis*), *Kashi* (oak), *shii* (*Q. cuspidata*), and other trees. On the wastes and moors we find *sumire* (*Viola Patrinii*), *tampopo* (*Taraxacum corniculatum*), *rengesô* (*Astragalus lotoides*), &c., among spring plants; among autumn ones, in addition to those named before, *fujibakama* (*Eupatorium chinense*), *suzuki* (*Eulalia japonica*), and others, in such abundance as to form a many coloured carpet varying according to the season spread over the land.

"In the fields and paddies grow rice, wheat, Indian corn, colza and raphanus under cultivation, the scene being diversified by scattered clumps of dark green bamboo groves. Then in the neighbourhood of temples and shrines are camphor laurels and *ichô* trees (*Ginkgo biloba*)—the camphor laurels are found indigenous only in China and Japan, but are cultivated elsewhere. The *ichô* is fairly common with us, and therefore not considered a curiosity, but abroad (with the exception of China) no tree resembling it is found—it is unique.

"Again, in ponds, swamps, lakes, and rivers we have *kawahone* (*Nuphar japonicum*), *iyunsai* (*Brasenia peltata*), *hishi* (*Trapa bispinosa*), *ukikusa* (*Lemna minor*), &c., and in the sea *arame* (*Ecklonia*?), *wakame* (*Alaria pinnatifida*), *kombu* (*Laminaria japonica*), *asakusanori* (a kind of laver), &c.

"On our high mountains only grow such plants as *kokemomo* (*Vaccinium* sp.), *ihôme* (*Blyxa* sp.?), *gankôran* (*Empetrum nigrum*), &c., also such plants as *yashi* (*Cocos nucifera*, but this may be a mistake),

hego (sp. of tree fern *Cyathea*), &c., of Asiatic and Malayan character, others of Mexican and American affinities, such as *saboten* (cactus), *riuzetsuran* (various parasitic orchids), &c., even Australian forms, such as *Acacia* and *Eucalyptus* (but these, of course, introduced).

"Our indigenous species of trees, shrubs and herbs, including cryptogams, are very numerous; in addition, among botanical forms we must count the innumerable microscopic organisms found in a drop of water or in mouldy rice.

"Some 140 years ago scarcely 10,000 species (of phanerogams and cryptogams?) were known to science; now more than 175,000 are known to flourish on our globe, and to be thus denizens of the province of botany."

The illustrations are extremely good, and many of them apparently original. Among the best are those of the hydrangea (*ajisai*), *Vicia faba* (*soramame*), the fruit of chestnut (*Kuri*), section of plum-fruit, wood of wild cherry and of *shuro* (*Trachycarpus*), the figure of a potato plant (*jagatara-imo*), dissection of iris flower, mistletoe on *Celtis*, &c. There are, in addition, two very finely coloured plates, both of gorges among the Nikko Hills, one—the frontispiece—showing, ingeniously enough, on its guard-fly leaf the outline figures with the names of the principal plants in the rich mass depicted in the chromo. Unfortunately, of the Japanese names given, only one or two can be identified in any books at my command. It is worth notice how large a proportion of the names of even common plants is Chinese.

Dr. Itô may be congratulated on the production of so excellent, indeed charming, an introduction to the study of that most fascinating of sciences, botany.¹

F. VICTOR DICKINS.

OUR UNIQUE EARTH!

Man's Place in the Universe. By Alfred R. Wallace, LL.D., D.C.L., F.R.S., &c. Pp. xi+330. (London: Chapman and Hall, Ltd., 1903.) Price 12s. 6d.

A BOOK from the pen of so distinguished a man as Dr. Alfred Russel Wallace would naturally find many readers, but the present volume, dealing with a subject of such general interest, will undoubtedly be widely distributed.

This work is the outcome of an article which Dr. Wallace published some time ago, and the interest it excited spurred him on to bring together in book form in a more elaborate and detailed manner the arguments on which the subject-matter was based.

The reader, therefore, has now before him the whole of the evidence upon which the author claims certain conclusions, which have "enormous probabilities in their favour," namely, "that no other planet in the solar system than our earth is inhabited or habitable," "that the probabilities are almost as great against any other sun possessing inhabited planets," and "that the nearly central position of our sun is probably a permanent one, and has been specially favourable,

¹ I am not sure of the accuracy of the above given botanical equivalents.

perhaps absolutely essential, to life-development on the earth."

A close perusal of the subject-matter indicates, in the first place, two prominent facts. First, the masterly way in which Dr. Wallace has marshalled the available subject-matter to enforce his lines of argument, and second, the excessively clear and concise summary of the astronomical knowledge which he has employed. This latter is contained in the first six chapters, and although the author suggests that those who are fairly acquainted with modern astronomical literature might omit reading these, the account is so excellent that the advice should not be followed.

It is not the object of this review to tell our readers whether Dr. Wallace is correct or not in the conclusions at which he has arrived, for that would not be an easy matter, but to direct attention to a work which must be treated with considerable respect.

Astronomical science has, during the last thirty years, made enormous strides, but the information that is needed when considering such a problem as is dealt with by Dr. Wallace is still very sparse, and is conspicuously absent from many books which by their titles ought to contain it.

Chapters vii. to ix. deal with the problems, Are the stars infinite in number? our relation to the Milky Way; and the uniformity of matter and its laws throughout the stellar universe. In all of these the author displays a very thorough acquaintance with the recent advances in these subjects. He concludes from such evidence that the stellar universe is limited, that the solar system is nearly in a central position of the Milky Way, this position being probably a permanent one, and, lastly, that the whole material universe is one as regards physical and chemical laws and material structure.

In the next chapter he sums up the essential characters of the living organism in a remarkably clear and definite manner, and points out the intimate connection between animal and vegetable life.

The chapter which follows describes all the physical conditions essential for this organic life, and then the four subsequent ones point out how these conditions, in his opinion, exist only on one planet, our earth, in the solar system. Not only does he suggest that the earth alone is inhabited, but that the other planets of the system have never been and never will be the seat of organic life, since they never can produce the exact conditions that are considered necessary.

The next and last chapter carries the argument into the starry realm beyond the solar system, and here the author gives his reasons for concluding that only a very few of these stars may be suns with life-supporting planets.

In considering man's place in the universe it seems that the matter dealt with in chapter x., in which the author describes the essential characters of the living organism, contains the criterion on which the whole question of the habitability of other worlds turns.

It is known that protoplasm is so complex chemically that it defies analysis, and protoplasm, to use Dr. Wallace's words, "is, as it were, only the starting

point or material out of which the infinitely varied structures of living beings are formed. The extreme mobility and changeability of the structure of these molecules enable the protoplasm to be continually modified both in constitution and form, and, by the substitution or addition of other elements, to serve special purposes."

May it not be that the very complex nature of protoplasm and its very property, the ease with which it may be modified, enable it to adapt itself to the various conditions, such as distance from central orb, size, &c., that exist on the different planets at those epochs in their life's history when the temperature conditions are within the prescribed limits?

Might not this element of living matter, working under somewhat different conditions, so affect the after products that they in their turn could weather the existing conditions, which to them would be natural and to us special?

To consider this earth as the only inhabited body in the stellar universe, a reversion to prehistoric ideas, may or may not be an advance, but it will require very strong arguments before man can be brought to consider that his isolation in the cosmos is indeed a fact.

The book, however, is one that should be read by all those interested in such a speculation, for speculation at the present time it can only be, and much valuable information may be learnt about the various subjects which the author has had to deal with in his broad survey.

OUR BOOK SHELF.

The Fauna of British India, including Ceylon and Burma. Published under the authority of the Secretary of State for India in Council. Edited by W. T. Blanford. Rhynchota. Vol. ii. Part. i. (Heteroptera). By W. L. Distant. Pp. x+242. (London: Taylor and Francis, 1903.) Price 10s.

MR. DISTANT is making good progress with the description of the known species of Indian Rhynchota, and the editor informs us in his preface that the remainder of the volume will comprise all, or nearly all, the remaining families of the division Gymnocerata, thus leaving the bulk of the water-bugs for a third volume, which will complete the subject as far as the Heteroptera are concerned. The present instalment includes 371 species belonging to the families Lygaeidae, Pyrrhocoridae, Tingididae, Phymatidae, Arceidae, Hebridae, Hydrometridae, Henicocephalidae, and the commencement of the Reduviidae. The letterpress is executed in the same careful manner as in the first volume, and is illustrated by 167 excellent text illustrations.

A considerable number of new species are described in the present part, and a very large proportion of the remainder have only become known to entomologists within the last few years, many of them, indeed, having been described by Mr. Distant, or others, as late as 1903. When we consider that the Hemiptera have been far from exhaustively collected at present, and that many of the families include small plant-feeding species, it will be plain that a vast amount of work still requires to be done before our knowledge of the Indian species can be considered as anything like complete. But such works as Mr. Distant's cannot but give a vast impetus to the study, while those who know its extent will not be liable to repeat the amusing error of Lich-